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| 10/031,024 | 03/28/2002 | Albertus Cornelis Den Brinker | NL 000287 | 4469 |

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Philips Electronics North America Corporation
Intellectual Property Department
580 White Plains Road
Tarrytown, NY 10591

| EXAMINER | |
|---|---|
| PIERRE, MYRIAM | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2654 | |

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/031,024 | DEN BRINKER ET AL. | |
| | Examiner | Art Unit | |
| | Myriam Pierre | 2654 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01/01/2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 March 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. EP0004599.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06/17/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Specification is missing heading or labels. Please refer to Content of Specification below for further details:

Content of Specification

(a) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

(2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(b) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(c) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

(d) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where

elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

2. Claim 3 objected to because of the following informalities: the preamble of uses the term "splitting" when referring to element 21 in Fig. 1, yet, in the specification, on page 5 line 28, element 21 is referred to as "subtractor". Appropriate correction is required.

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the steps of the claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

2. Claim 7 is objected to because of typographical errors in the dependency.

Appropriate correction is required. Claim 7 should depend on claim 3.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahlgren et al. (IEEE-95).

As to claims 1 and 8, Dahlgren et al. teach

splitting the target spectrum in at least a first part and a second part (breaking transfer function model into two parts, page 437 ARMA Model left column first paragraph);

using a first model operation ($b_k$ coefficients are set to zero, except $b_o$=1) on the first part of the target spectrum (ARMA model, linear difference equation) to obtain auto-regressive parameters (the AR model can be extracted from ARMA model (linear difference equation) if all the $b_k$ coefficients are set to zero, except $b_o$=1, page 437 ARMA Model left column first paragraph).

using a second model operation ($a_k$ coefficients are set to zero, except $a_o$=1) on the second part of the target spectrum (ARMA model, linear difference equation) to obtain moving-average parameters (The MA model is extracted from the ARMA model

(linear difference equation) by setting all of the $a_k$ coefficients are set to zero, except $a_o$=1, page 437 ARMA Model left column first paragraph); and

combining the auto-regressive parameters (sharp peaks) and the moving average (deep valleys) parameters (ARMA) to inherently obtain the filtered parameters (the AR model is appropriate for spectra containing sharp peaks, the MA model is appropriate for spectra that contains deep valleys, the combined ARMA model contains both of these extremes, sharp peaks and deep valleys, page 437 ARMA Model right column first paragraph)

As to claim 2, Dahlgren et al. teach

using the first modeling operation on an inherent reciprocal of the second part of the target spectrum (page 437, ARMA modeling, equation 5; AR modeling process, the first part, is inherently the reciprocal of the MA modeling process, or the second part because the AR process involves the all-pole model and the MA modeling process involves the opposite or reciprocal, the all-zero model).

As to claim 3, Dahlgren et al. teach

taking an initial split in an initial first part and an initial second part (breaking transfer function model into two parts, page 437 ARMA Model left column first paragraph, the two parts are inherently the initial split of the fist part, AR, and second part, MA) ; and

using an iterative procedure to obtain a better split than the initial split until a threshold value is met (Maximum likelihood estimation, page 437 right column second paragraph, equation 6-9, the Akaike information criterion is an estimator for the AR and MA models in equations 6-7).

As to claim 4, Dahlgren et al. teach

using a first modeling operation on a first part of a previous split to obtain new auto-regressive parameters (equations 7-8 page 437);

using a second modeling operation on a second part of a previous split to obtain new moving-average parameters (equations 6 and 8 page 437);

inherently re-attributing parts of the first part of the previous split that could be modeled accurately by the first modeling operation to the second part of the previous split (ARMA, page 437 ARMA Modeling left column first paragraph)

As to claim 5, Dahlgren et al. teach

inherently dividing the first part of the previous split by an estimate of the target spectrum based on moving-average parameters (MLE, maximum likelihood estimation of noise for ARMA, which inherently includes the MA parameters page 437 right column second paragraph);

inherently dividing the second part of the previous split by an estimate of the target spectrum based on auto-regressive parameters (AIC is a good estimator for the

AR and MA, page 437, equations 6-9, ARMA Modeling, right column, second paragraph).

As to claim 6, Dahlgren et al. teach

an inherent initial first part comprises at least a significant part of the target spectrum above a mean logarithmic level and the inherent initial second part comprises at least a significant part below said level (MLE, maximum likelihood estimation of noise for ARMA, which inherently includes the MA parameters page 437 right column second paragraph; MLE inherently would divide the data falling into parts below a given standard and above a given standard);

As to claim 7, Dahlgren et al. does not teach splitting via a mapping function.

However, Official Notice is taken that calculating a mapping function is well-known in repeated patterns or periodic functions in order to accurately calculate the parameters within a given domain, thus at the time of the invention, it would have been obvious to one of ordinary skill in the art to implement a mapping function as a design option in order to estimate better parameters, thus avoiding errors in partitioning the designed parameters.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlgren et al. (IEEE-95) in view of Bloebaum et al. (6,070,137).

As to claims 9 and 10 Dahlgren teach

the step of modeling comprising:

splitting the target spectrum in at least a first part and a second part (breaking transfer function model into two parts, page 437 ARMA Model left column first paragraph);

using a first model operation ($b_k$ coefficients are set to zero, except $b_o$=1) on the first part of the target spectrum (ARMA model, linear difference equation) to obtain auto-regressive parameters (the AR model can be extracted from ARMA model (linear difference equation) if all the $b_k$ coefficients are set to zero, except $b_o$=1, page 437 ARMA Model left column first paragraph).

using a second model operation ($a_k$ coefficients are set to zero, except $a_o$=1) on the second part of the target spectrum (ARMA model, linear difference equation) to obtain moving-average parameters (The MA model is extracted from the ARMA model (linear difference equation) by setting all of the $a_k$ coefficients are set to zero, except $a_o$=1, page 437 ARMA Model left column first paragraph); and

combining the auto-regressive parameters (sharp peaks) and the moving average (deep valleys) parameters (ARMA) to inherently obtain the filtered parameters (the AR model is appropriate for spectra containing sharp peaks, the MA model is

appropriate for spectra that contains deep valleys, the combined ARMA model contains both of these extremes, sharp peaks and deep valleys, page 437 ARMA Model right column first paragraph)

modeling a spectrum of the noise by determining filter parameters of a filter which has a frequency response approximating the spectrum of the noise (page 437 right col. first paragraph, modeling a filter based on noise is inherent in MA process).

Dahlgren teach approximating modeling a filter based on noise (page 437 right col. first paragraph).

Dahlgren does not explicitly teach modeling a filter based on spectral subtraction or noise reconstruction.

However, Bloebaum teach

modeling a spectrum of the noise by determining filter parameters of a filter which has a frequency response approximating the spectrum of the noise (MBE, mixed band excitation, models background noise, in frequency domain, col. 5 lines 21-33, col. 2 lines 20-26).

subtracting the reconstructed noise from the audio signal to obtain a noise-filtered audio signal (spectral estimator, subtracts portion of the noise power spectral density fro current speech power spectral, col. 3 lines 21-31);

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement AR and MA techniques with Bloebaum's adaptive spectral enhancement filtering technique in order to reduce the variance in of the noise estimate, as taught by Bloebaum, col. 5 lines 27-35.

7. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlgren et al. (IEEE-95) in view of Miseki et al. (6,167,375).

As to claims 11 and 13,

Dahlgren teach

the steps (necessary in ARMA) modeling comprising:

splitting the target spectrum in at least a first part and a second part (breaking transfer function model into two parts, page 437 ARMA Model left column first paragraph);

using a first model operation ($b_k$ coefficients are set to zero, except $b_o$=1) on the first part of the target spectrum (ARMA model, linear difference equation) to obtain auto-regressive parameters (the AR model can be extracted from ARMA model (linear difference equation) if all the $b_k$ coefficients are set to zero, except $b_o$=1, page 437 ARMA Model left column first paragraph).

using a second model operation ($a_k$ coefficients are set to zero, except $a_o$=1) on the second part of the target spectrum (ARMA model, linear difference equation) to obtain moving-average parameters (The MA model is extracted from the ARMA model (linear difference equation) by setting all of the $a_k$ coefficients are set to zero, except $a_o$=1, page 437 ARMA Model left column first paragraph); and

combining the auto-regressive parameters (sharp peaks) and the moving average (deep valleys) parameters (ARMA) to inherently obtain the filtered parameters (the AR model is appropriate for spectra containing sharp peaks, the MA model is appropriate for spectra that contains deep valleys, the combined ARMA model contains

both of these extremes, sharp peaks and deep valleys, page 437 ARMA Model right column first paragraph; the ARMA includes the combination of AR and MA).

Dahlgren does not explicitly teach modeling waveform parameters.

However, Miseki et al. teach

determining basic waveforms in the audio signal (CELP, col. 2 lines18, 49-51);

obtaining a noise component from the audio signal by subtracting the basic waveforms from the audio signal (CELP, suppresses distortion of a waveform, col. 2 lines 51-55, suppression of the distortion of waveform is necessarily subtracting or removing the distortion or noise portion of the waveform).

modeling a spectrum of the noise component by determining filter parameters of a filter which has a frequency response approximating the spectrum of the noise component (Fig. 17-18 and col. 23 lines 21-35; the predictor estimates the spectral shape, thus modeling the spectrum, Fig. 18 is the noise encoder of Fig. 15, thus modeling the spectrum of noise, via filter parameters such as AR, MA, or ARMA used in the predictor, element 547, of Fig. 18);

including the filter parameters (AR, MA, or ARMA) and waveform parameters (CELP) representing the necessary basic waveforms in an encoded audio signal (col. 2 line 51 and col. 23 lines 20-26).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to model waveform parameters via AR, MA, or ARMA parameters in order to easily obtain background noise with less bits by encoding the components after

converting them into parameters in the frequency domain or transform domain, as taught by Miseki et al., col. 2 lines 50-58.

8. Claims 12, 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlgren et al. (IEEE-95) in view of Miseki et al. (6,167,375) in further view of Atsmon et al. (6,607,136 benefit of provisional application 60/153,858)

As to claim 12 and 14,

Dahlgren teaches all the limitations of claim 11.

Dahlgren does not explicitly teach decoding an audio signal.

However, Miseki et al. teach encoding and decoding of audio signals (Abstract) which includes the method and means for

filtering a white noise signal (background noise) to necessarily obtain reconstructed noise component, which filtering is determined by the filter parameters (col. 23 lines 21-35 and col. 1 lines 8-13).

synthesizing basic waveforms based on the waveform parameters (CELP, col. 2 lines 51-55; CELP well known for synthesizing speech signals or waveforms)

adding the reconstructed noise component to the synthesized basic waveform to obtain a decoded audio signal (col. 25 lines 51-67; adding the reconstructed noise component is a necessary reconstruction process of a synthesized waveform).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to decode speech for efficiency in reconstructing the original signal waveform, wherein a speech signal including background noise is encoded by compressing it

efficiently in a state which is as close to the original signal speech as possible, as taught by Miseki et al., col. 1 lines 8--13.

Neither Dahlgren et al. nor Miseki et al. explicitly teach implementing an audio player.

However, Atsmon et al. teach audio player (col. 35 lines 10-11).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement audio signal technique in an audio player for transmission of data streams, thus if sound is utilized a conventional audio file is played by a software audio player as is known in the art, as taught by Atsom et al. (col. 35 lines 5-11).

As to claim 15,

Neither Dahlgren et al. nor Miseki et al. explicitly teach implementing an audio player.

However, Atsmon et al. teach audio player (col. 35 lines 10-11).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement audio signal technique in an audio player for transmission of data streams, thus if sound is utilized, a conventional audio file is played by a software audio player as is known in the art, as taught by Atsom et al. (col. 35 lines 5-11).

As to claim 16

Dahlgren et al. does not teach waveform coding.

However, Miseki et al. teach

Miseki et al. teach

waveforms parameters representing basic waveforms (CELP, col. 2 lines18, 49-51);

a spectrum of the noise component represented by a combination of autoregressive parameters and moving average parameters (col. 23 lines 21-35 and col. 2 line 51 and col. 23 lines 20-26; the predictor estimates the spectral shape, thus modeling the spectrum, Fig. 18 is the noise encoder of Fig. 15, thus modeling the spectrum of noise, via filter parameters such as AR, MA, or ARMA used in the predictor, element 547, of Fig. 18, thus the ARMA includes the combination of AR and MA).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to model waveform parameters via AR, MA, or ARMA parameters in order to easily obtain background noise with less bits by encoding the components after converting them into parameters in the frequency domain or transform domain, as taught by Miseki et al., col. 2 lines 50-58.

As to claim 17,

Dahlgren et al. does not explicitly teach implementing a storage medium for the encoded audio signal.

However, Miseki et al. teach

a storage medium on which an encoded audio signal is stored (col. 27, lines 53-57).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to store encoded audio signals in order for updating, thus the output is stored in a buffer to update the same in preparation for the input of the spectral shape of the next frame, as taught by Miseki et al., col. 27, lines 53-57.

## *Conclusion*

9. The following art made of record and not relied upon is considered pertinent to applicant's disclosure Romesburg et al. (6,160,886); Seza et al. (5,553,194); and Eatwell (5,742,694).

Romesburg et al. teach echo suppression.

Seza et al. teach encoder unit includes AR and MA codebooks vocoder device.

Eatwell teaches noise reduction for enhancing noisy audio signals.

Tosaya et al. teach audible and inaudible voice recognition.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Myriam Pierre whose telephone number is 571-272-7611. The examiner can normally be reached on Monday – Friday from 5:30 a.m. - 2:00p.m.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information as to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

05/11/2005

Vijay B Chawan

VIJAY CHAWAN
PRIMARY EXAMINER